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SHORTER ARTICLES AND CORRESPONDENCE

COMPUTATION OF THE COEFFICIENT OF CORRELATION

In Dr. Harris's recent note[1] suggesting a helpful modification of the method of computing the coefficient of correlation, the only objection mentioned is the fact that his method results in very large product-numbers. This difficulty can be considerably reduced by a procedure based on the fact that the calculation of the standard deviation and the coefficient of correlation does not depend upon the absolute dimensions of the things measured. All that is required is a given series of successive grades; the standard deviation will then be obtained in terms of the units separating the grades, whatever they are; while the coefficient of correlation is a relative number, quite independent of the value of the units. We may therefore give to the lowest grade of both sets of measurements (x and y) the value 0, for the succeeding ones the values 1, 2, 3, 4, etc., instead of the real values; the labor of computation will then be greatly reduced, while the same value will be found for the two constants in question. The values which Dr. Harris calls A_x and A_y will by this method not be the means of x and y (so that they may well be designated rather d_x and d_y), but the means can be obtained from them without labor by simply adding to each the absolute value of the lowest grade of x and of y, respectively (since we had reduced all grades by this amount, in substituting 0 for the lowest grade).

This much simplifies the computations when the absolute dimensions are represented by numbers considerably greater than unity. Thus, in Dr. Harris's Table III., in finding the standard deviation we should for the third grade have to multiply by but 4, instead of by the square of 28.

H. S. Jennings

NOTE ON BATRACHOSEPS ATTENUATUS ESCH.

Batrachoseps attenuatus is the most abundant salamander in the vicinity of Stanford University. During the rainy season

[1] This journal, November, 1910.

it can be found under nearly every rock and log on the neighboring foothills. No one has, so far as I am aware, discovered and described its egg-laying habits. The author obtained some of the eggs of this salamander and the following brief note is published with the hope that it may attract the attention of some student to this problem.

The first eggs obtained were discovered by T. Kimura during January, 1906. They were found partly buried in depressions under rocks on a moist hill side. On January 5, 1907, the author found some eggs under a log in a moist ravine well up in the hills. The eggs were deposited in small pockets in the ground; 21 were in one group and 10 in another group about 2 feet distant, while 4 were scattered between, suggesting that all were deposited by a single female. These eggs were round or slightly oval and about 6 mm. in diameter. Development was well advanced. The first individual to issue from the egg appeared on January 28, and was 17 mm. in length and of a dull black color. By May 22 it had doubled in length and was 35 mm. long. The majority of the eggs, when found, were covered with a fungus and failed to develop. This suggests that they may have been under abnormal conditions. It seems very likely that the majority of the eggs of this species are deposited just beneath the surface of the ground, as is the case with earthworm eggs and so escape detection. Diligent search at the proper season should settle this question.

Batrachoseps attenuatus disappears from this region with the approach of the dry season and appears suddenly in the fall after the first heavy rains. I have been informed that it can be obtained at any season in the moist coast region near Pacific Grove. It seems probable that in the dry regions this salamander burrows into the ground as the earthworm does to escape the drought. This theory is supported by the shape of the body, which is elongate, slender and roundish, suggesting that of the earthworm. It appears that we have here a parallel development of form and habit between *B. attenuatus* and the earthworm due to a struggle against the same physical environment.

C. V. BURKE.